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10/628,742

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L11: (2178) (24/662|24/5... | US 6527471 B2 | Tag: S,T1 | Doc: 61

US-PAT-NO: 6527471

DOCUMENT-IDENTIFIER: US 6527471 B2

TITLE: Sealing spring fastene

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56	☐	☐	US 6547317 B1	20030415	13
57	☐	☐	US 6543098 B2	20030408	6
58	☐	☐	US 6542367 B2	20030401	10
59	☐	☐	US 6530130 B2	20030311	4
60	☐	☐	US 6529378 B2	20030304	9
61	☐	☑	US 6527471 B2	20030304	6
62	☐	☐	US 6526634 B1	20030304	10

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L11: (2178) (24/662|24/5... | US 6527471 | Tag: S,T1 | Doc: 61/20...

(12) **United States Patent**
Smith et al.

(10) Patent No.: US 6,527,471 B2
(45) Date of Patent: Mar. 4, 2003

(54) **SEALING SPRING FASTENER WITH CLOSED CAVITY**

(75) Inventors: Michael Walter Smith, Lake Zurich, IL (US); Gary John Babcock, Inglenook, IL (US)

(73) Assignee: Textron Corporation, Schaumburg, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 63 days

(21) Appl. No.: 09/737,424

(22) Filed: Dec. 15, 2000

(65) Prior Publication Data

US 2002/0076298 A1 Jun. 6, 2002

Related U.S. Application Data

(60) Provisional application No. 60/170,655, filed on Dec. 13, 1999.

(51) Int. Cl.[7] A44B 21/00; F16L 13/00

(52) U.S. Cl. 403/297; 403/267; 403/313; 403/377; 403/322; 403/379; 403/379.4; 403/408.1; 24/297; 24/304; 277/637; 277/650; 277/644; 277/653

(58) Field of Search ..... 24/295, 293, 294, 297, 453, 458, 704.1, 714.1, 716.6, 717.3, 717.6, 717.7, 717.9; 411/508, 509, 510, 517; 277/630, 637, 650, 644, 653; 403/379.4, 224, 225, 226, 227, 315, 316, 324, 325, 327, 378, 379.6, 408.1, DIG. 4, DIG. 11, DIG. 14

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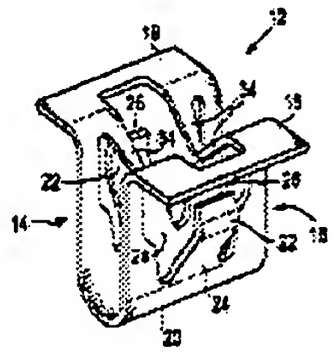
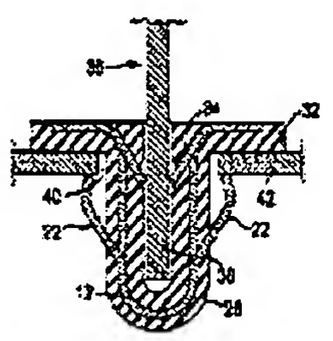
Primary Examiner—Christopher J. Novosad
(74) *Attorney, Agent, or Firm*—B. Vanderhye

(57) **ABSTRACT**

This invention relates to a sealing spring fastener, which comprises a U-shaped retainer, an elastic sealing member that has been compressed. The elastic sealing member within the U-shaped retainer. The sealing spring fastener can then be assembly with an entrance of a panel, panel, or a plastic panel. The assembly of the fastener by itself can be engaged into the slot of a solid sheet, preferably a metal sheet, in a manner that one side of the sheet is sealed from the other side of the sheet in the vicinity of the slot.

16 Claims, 3 Drawing Sheets





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L6: (166) clip with tr... | US 6141837 A | Tag: S,T1 | Doc: 29/166 |

US-PAT-NO: 6141837

DOCUMENT-IDENTIFIER: US 6141837 A

TITLE: EDIAS clip for securin
frame

Details Text Image HTML TI

L6: (166) clip with tr... | US 6141837 A | Tag: S,T1 | Doc: 29/166 |

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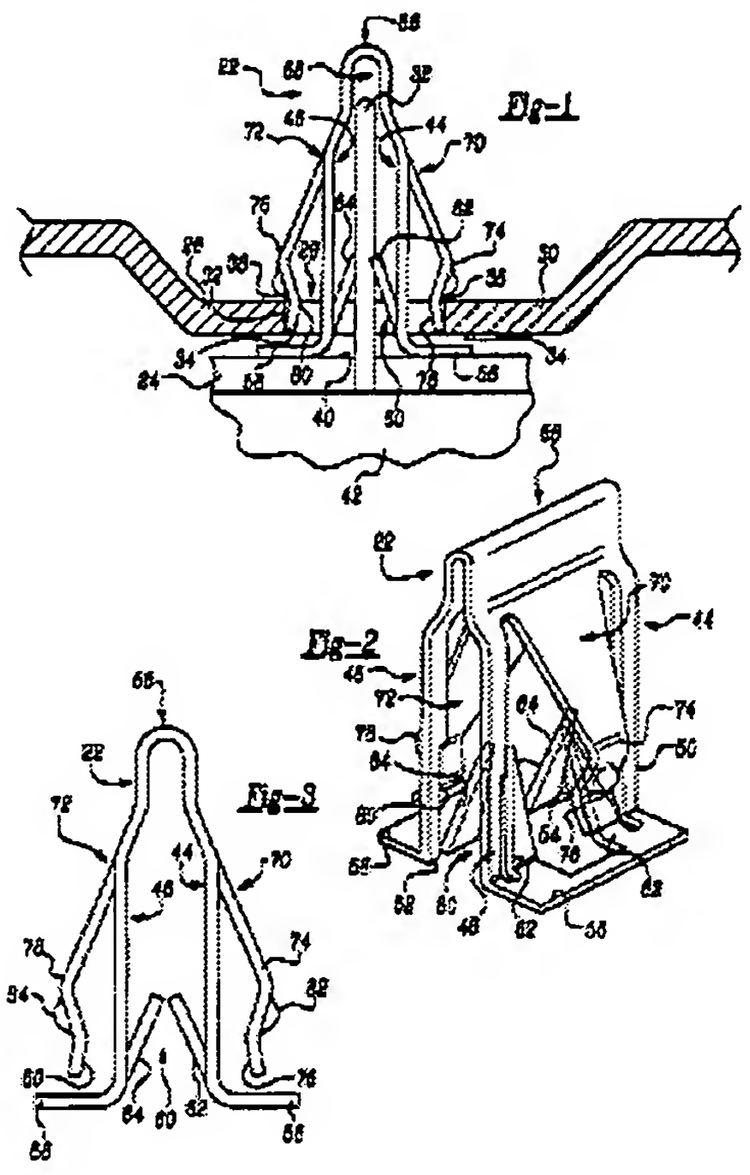

Fig-1

Fig-2

Fig-3

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US-PAT-NO: 6279207

DOCUMENT-IDENTIFIER: US 6279207 B1

TITLE: Fasteners with increas

Details Text Image HTML TI

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5	☑	☑	US 6074150 A	20000613	11
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Details Text Image HTML

(12) **United States Patent**
Vassiliou

(10) Patent No.: US 6,279,207 B1
(45) Date of Patent: Aug. 28, 2001

(54) FASTENERS WITH INCREASED HOLDING POWER

(75) Inventor: Eustathios Vassiliou, Newark, DE (US)

(73) Assignee: WEPA, Pennsylvania Inc., Newark, DE (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/484,914

(22) Filed: Jan. 18, 2000

Related U.S. Application Data

(60) Provisional application No. 60/116,048, filed on Feb. 1, 1999.

(51) Int. Cl.[7] A44B 17/00; A44B 21/00; F16B 21/00

(52) U.S. Cl. 24/297; 24/581; 24/295

(58) Field of Search 24/297, 573, 295

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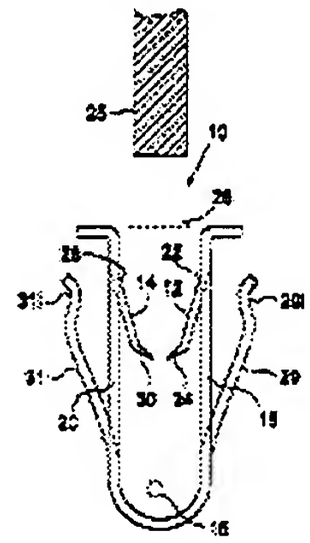
Primary Examiner—Victor N. Sakran
(74) Attorney, Agent, or Firm—E. Vassiliou

(57) ABSTRACT

This invention discloses fasteners characterized by the use of parts to provide a primary object to them. More particularly, the parts which are used are ordinarily elegant parts resulting in considerable increase of the holding force without increasing the elasticity of the parts, and without rendering the fastener susceptible of various thicknesses of the primary object to be fastened.

21 Claims, 3 Drawing Sheets



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L11: (2178) (24/662|24/5... | US 6497011 | Tag: S,T1 | Doc: 76/20...

US-PAT-NO: 6497011

DOCUMENT-IDENTIFIER: US 6497011 B2

TITLE: Vehicle having parts c
fastener comprising a h

Details Text Image HTML TI

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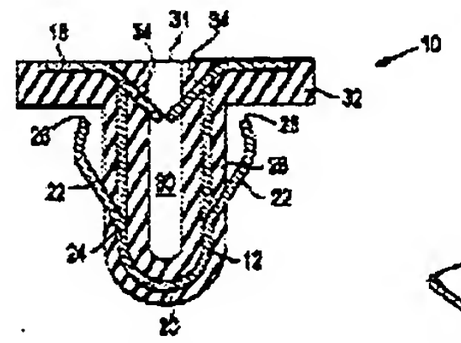

FIG. 1

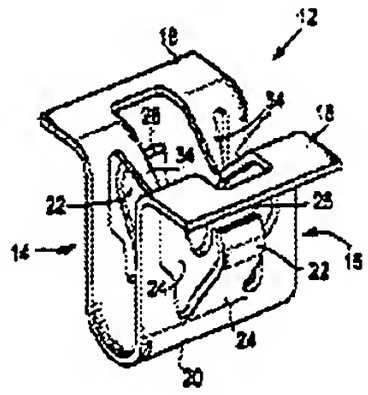

FIG. 2

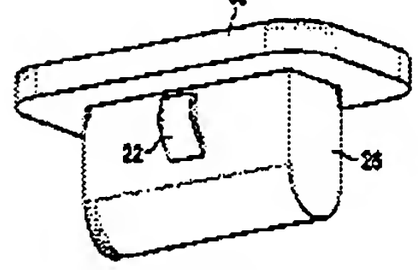

FIG. 3

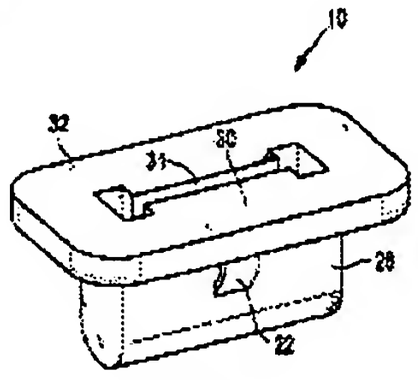

FIG. 4

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US-PAT-NO: 6141837

DOCUMENT-IDENTIFIER: US 6141837 A

TITLE: EDIAS clip for securin
frame

Details Text Image HTML TI

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204	☐	☐	US 6178605 B1	20010130	11	S
205	☐	☐	US 6173754 B1	20010116	9	V
206	☐	☐	US 6173542 B1	20010116	8	S
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208	☐	☐	US 6164603 A	20001226	9	E
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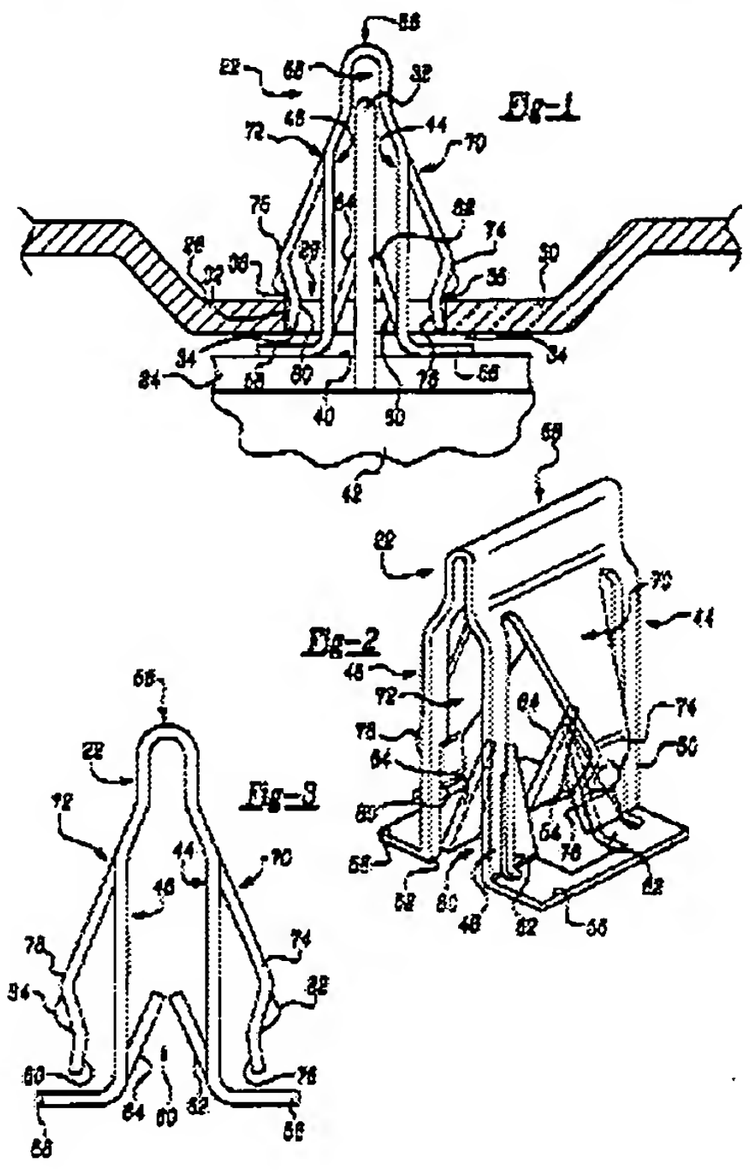

Fig-1

Fig-2

Fig-3

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